Web Material

**Trends in "Deaths of Despair" Among Working-Aged
White and Black Americans, 1990-2017**

Andrea M. Tilstra, Daniel H. Simon, and Ryan K. Masters

WEB APPENDIX 1

This appendix provides results from sensitivity analyses on period- and cohort-based trends in U.S. black and white men's and women's mortality rates from "deaths of despair." The results from the sensitivity analyses are consistent with the estimated period-based and cohort-based mortality trends presented in the paper. We first explore age-specific mortality rates across time periods to determine if "non-parallelism" is observed in the period-based trends of age-specific mortality rates (Kupper et al. 1985). We then test the internal validity of the period and cohort trends estimated from the Intrinsic Estimator (IE) APC models by changing the referent categories (Luo et al. 2016; Masters et al. 2016). We test the external validity of the estimates by comparing the APC trends estimated from the IE model with APC trends estimated from a model fitted using maximum entropy with set identification (Browning et al. 2012).

Select results from these analyses are presented in figures below.

1. Period-based trends in age-specific mortality rates from suicides, drug-related deaths, alcohol-related deaths. These trends are observed on the absolute scale in Web Figures 1, 2, 3.

2. Estimated period and cohort effects on white men's mortality rates from drug-related deaths, estimated from APC models fitted with IE estimator and estimated from APC models fitted using set identification with maximum entropy. These trends are observed in Web Figure 4.

3. Estimated period and cohort effects on white women's drug-related mortality rates from APC models fitted with IE estimator using first APC categories as referents and with IE estimator using last APC categories as referents. These trends are observed in Web Figure 5.

Web Figure 1. Changes in Age-specific Death Rates from Intentional Self-harm, U.S. Black and White Men and Women, 1990-2017.
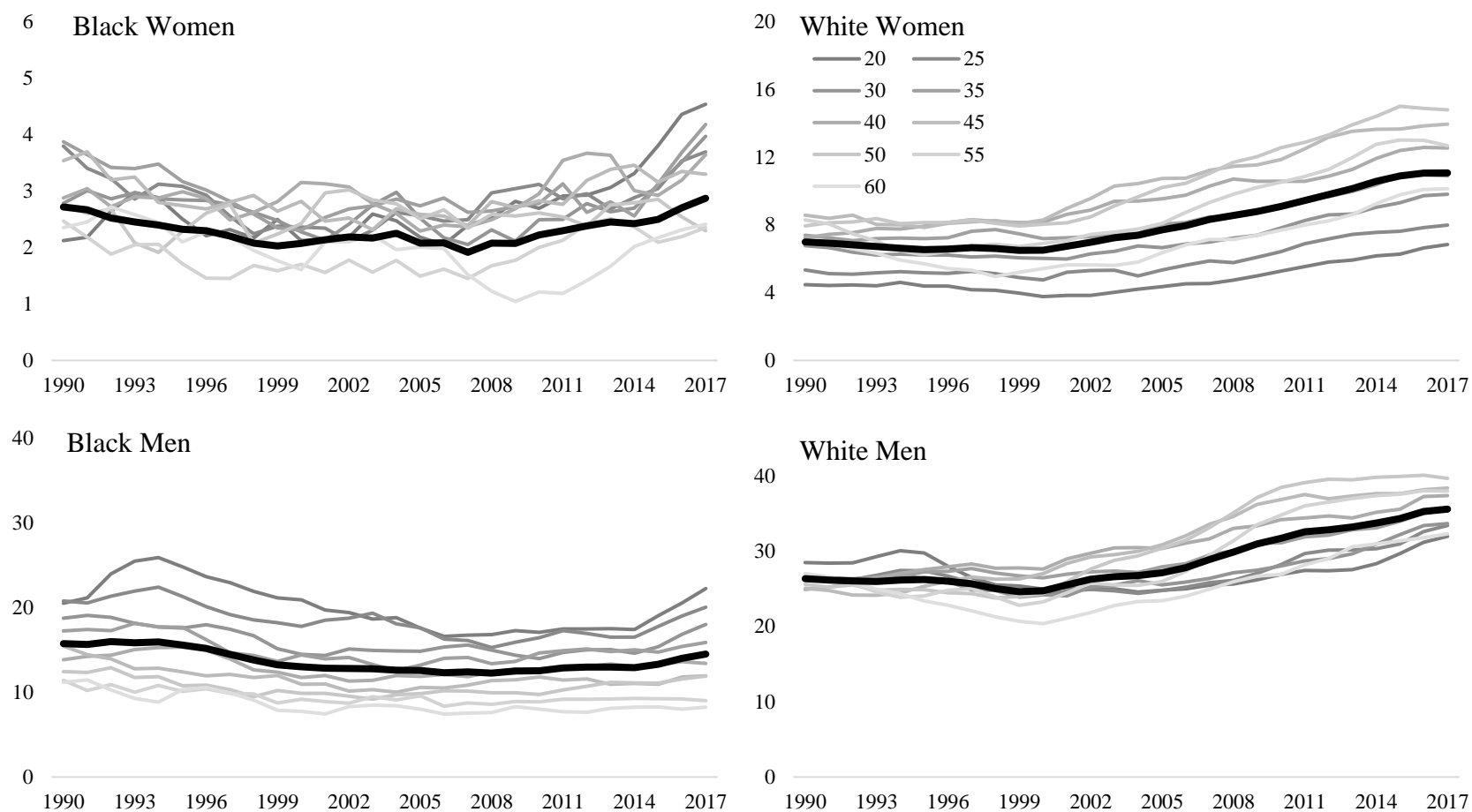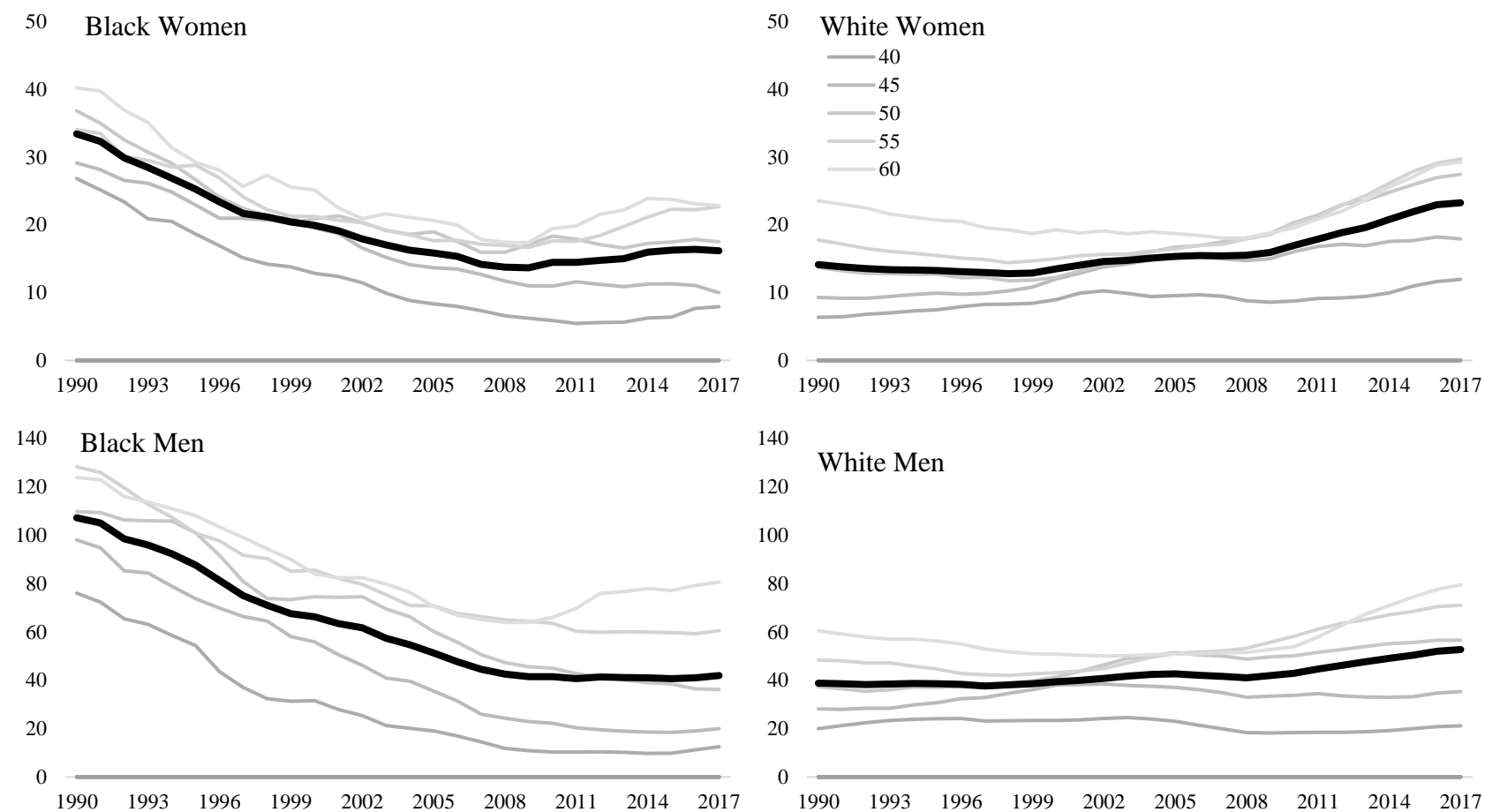

Note: Black line indicates average trend.

Web Figure 2. Changes in Age-specific Death Rates from Drug Use, U.S. Black and White Men and Women, 1990-2017.
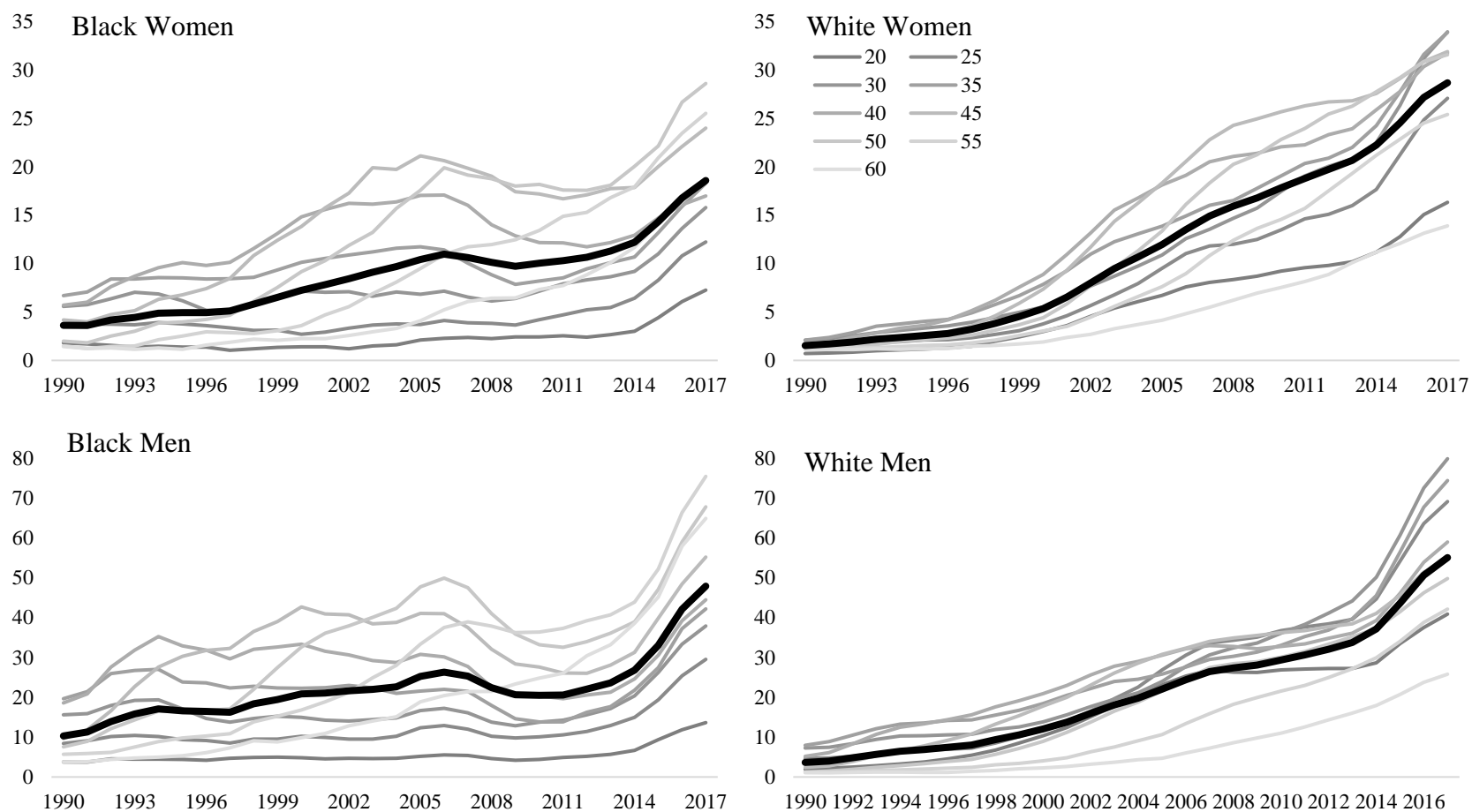

Note: Black line indicates average trend.

Web Figure 3. Changes in Age-specific Death Rates from Alcohol Use, U.S. Black and White Men and Women, 1990-2017.


Note: Black line indicates average trend.

Web Figure 4. Period-based Variation (top) and Cohort-based Variation (bottom) in U.S. White Men's Mortality Rates from Drug Use, Estimated from APC Model Fitted Using Intrinsic Estimator (black) and Set Identification with Maximum Entropy Estimator (gray area).
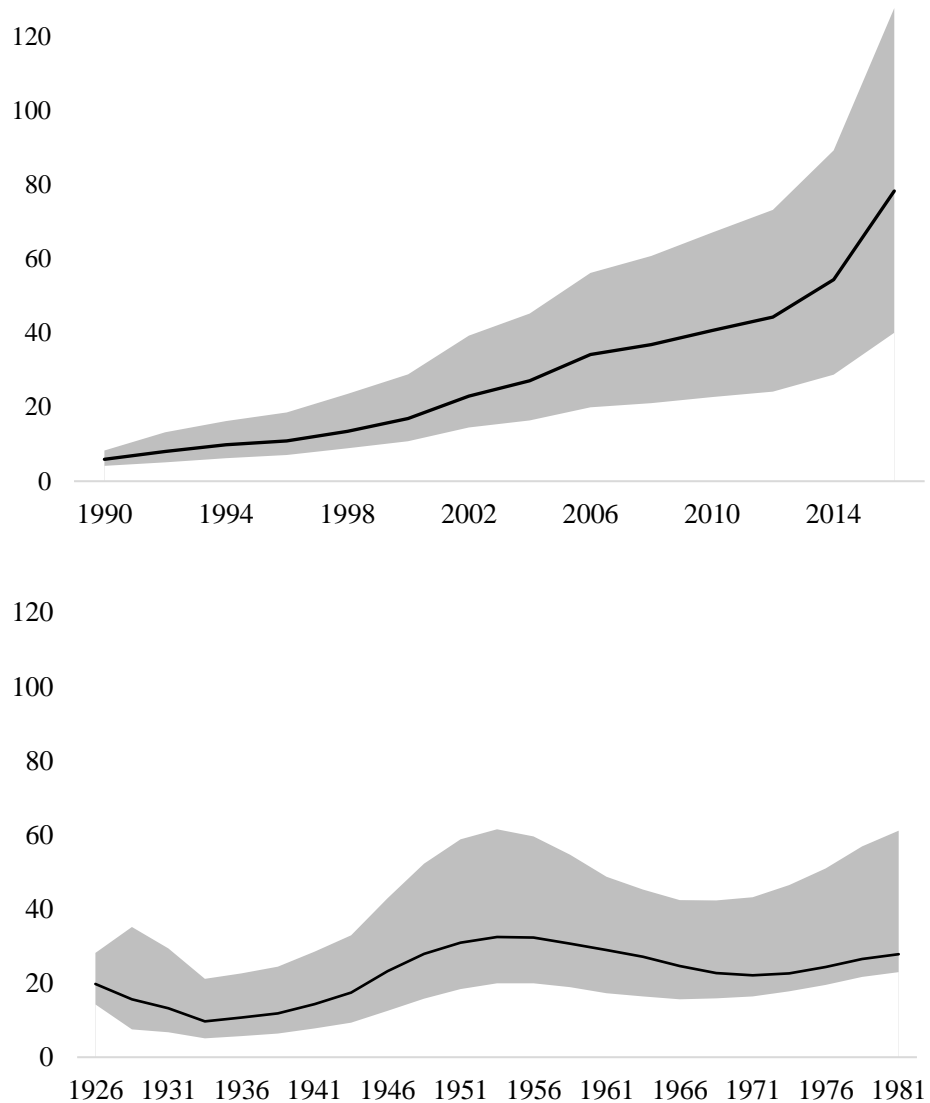
Note: Gray shaded area denotes 95% Confidence Intervals of MEE Estimates

Web Figure 5. Period-based Variation (top) and Cohort-based Variation (bottom) in U.S. White Women's Mortality Rates from Drug Use Estimated from APC Model Fitted Using the Intrinsic Estimator Constraint with First APC Categories as Reference Groups (dashed lines) and Last APC Categories as Reference Groups (solid lines).
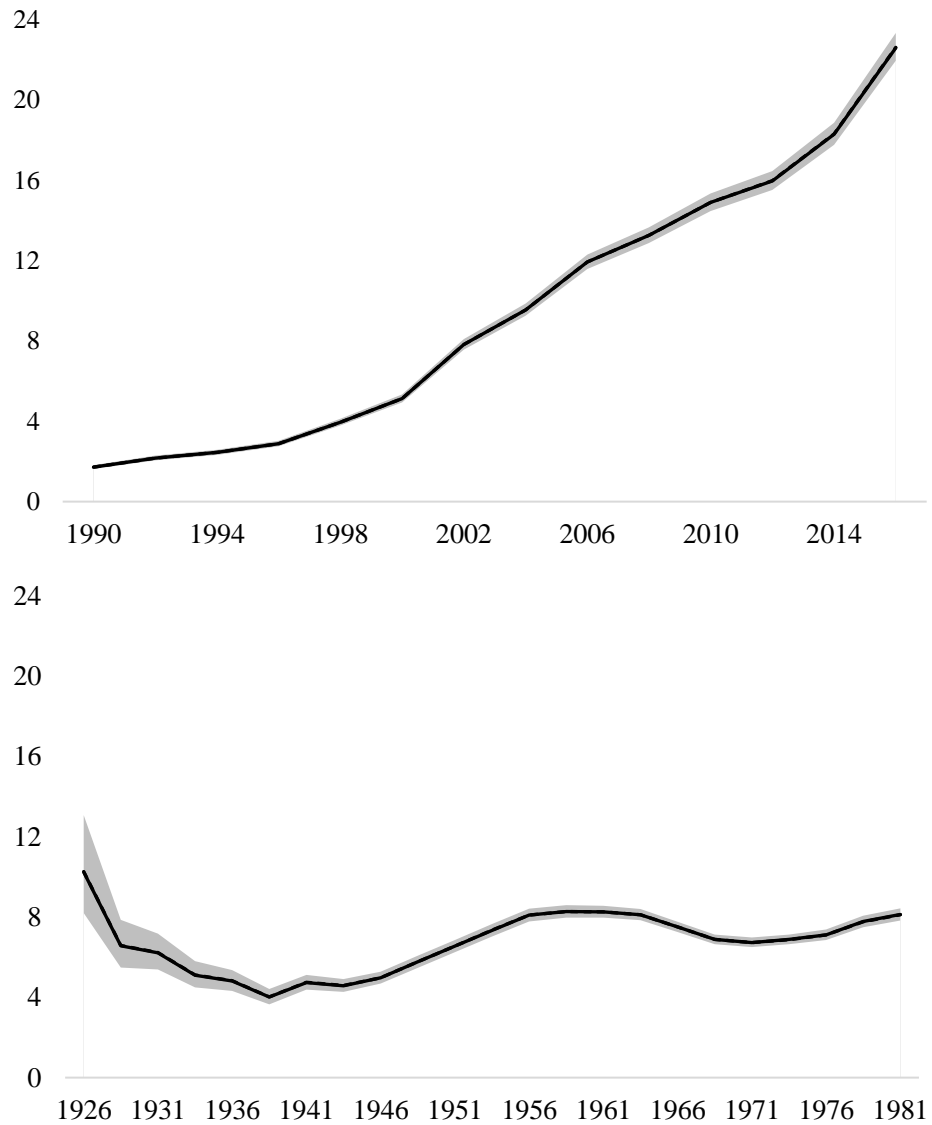
Note: Gray shaded area denotes 95% Confidence Intervals of Estimates.

Web Appendix References

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Luo, L, Hodges JS, Winship C, and Powers D. The sensitivity of the intrinsic estimator to coding schemes: a comment on Yang, Schulhofer-Wohl, Fu, and Land. *American Journal of Sociology*. 2016; 122: 930-961.

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